

ABSTRACT OF THE DISCLOSURE

Method and apparatus for using a silylating agent after exposure to an oxidizing environment for repairing damage to low-k dielectric films are described. Plasma photoresist removal, or ashing, may damage bonds in the low-k materials, which may lead to a significant increase in the dielectric constant of the materials. The silylating agent may be used to repair damage to the low-k films after the ashing process. Additionally, a curing process using an oxidizing environment may damage bonds in low-k materials, which may subsequently be repaired by a silylating process. The described method and apparatus may be used with low-k dielectric films including hydrophobic porous oxide films. A chamber for processing a wafer in an oxidizing environment and subsequently performing a silylation process includes an oxidizing agent inlet and a silylating agent inlet. Additionally, a chamber for performing an etch process, processing a wafer in an oxidizing environment, and subsequently performing a silylation process includes an oxidizing agent inlet, a silylating agent inlet, and an etch gas inlet. A cluster tool can include a chamber for processing a wafer in an oxidizing environment and subsequently performing a silylation process, a wafer in/out module, and may include additional processing modules such as etch modules, deposition modules for depositing low-k layers, and deposition modules for depositing cap layers.

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